

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A silicon casting apparatus comprising:

a mold for holding a silicon melt therein and cooling and solidifying the silicon melt to produce silicon ingot;

a heating mechanism for heating the silicon melt and disposed with a distance from the mold kept constant above the mold; and

a cooling mechanism disposed below the heating mechanism for cooling the silicon melt, characterized in that

the cooling mechanism comprises a cooling member for cooling an outer surface of the mold,

the cooling member having a heat receiving surface brought into direct contact with a heat radiation surface that is

(i) the outer surface of the mold, or

(ii) a surface, other than a contact surface with which the outer surface of the mold is brought into contact, of a heat transfer member comprising the contact surface,

or arranged in close proximity thereto with a predetermined gap,

and is moved relative to the mold or the pedestal heat transfer member in order to change the heat exchange area, brought into contact with or arranged in close proximity to the heat radiation surface, of the heat receiving surface.

2. (Previously presented) The silicon casting apparatus according to claim 1, wherein the cooling member comprises a bottom cooling member for cooling

a bottom surface of the mold, the bottom cooling member having a heat receiving surface brought into direct contact with a heat radiation surface that is

(1) the bottom surface of the mold, or

(2) a surface, other than a placement surface serving as a contact surface, on which the mold is placed with the bottom surface of the mold being in contact therewith, of a pedestal serving as a heat transfer member comprising the placement surface,

or arranged in close proximity thereto with a predetermined gap,

and is moved relative to the mold or the pedestal in order to change the heat exchange area, brought into contact with or arranged in close proximity to the heat radiation surface, of the heat receiving surface.

3. (Previously presented) The silicon casting apparatus according to claim 2, wherein the bottom cooling member is moved in a plane direction of the heat radiation surface relative to the mold or the pedestal while maintaining a state where the heat receiving surface thereof is kept in direct contact with the heat radiation surface.

4. (Previously presented) The silicon casting apparatus according to claim 2, wherein the bottom cooling member is moved in a plane direction of the heat radiation surface relative to the mold or the pedestal while maintaining a state where the heat receiving surface thereof is arranged in close proximity to the heat radiation surface with a predetermined gap.

5. (Previously presented) The silicon casting apparatus according to claim 4, wherein the gap between the heat radiation surface and the heat receiving surface is not more than 10 mm.

6. (Previously presented) The silicon casting apparatus according to claim 2, wherein a thermal conductivity of the pedestal is not less than 40 W/(m ·K).

7. (Previously presented) The silicon casting apparatus according to claim 6, wherein the pedestal has one surface serving as the placement surface, a surface opposite to the placement surface being parallel to the placement surface, and is formed in the shape of a plate having a constant thickness, and the thickness is not less than one-sixth of a stretch length of a contact region between the placement surface and the bottom surface of the mold placed on the placement surface.

8. (Previously presented) The silicon casting apparatus according to claim 1, wherein the mold comprises a bottom plate and a side plate raised upward from a peripheral edge of the bottom plate, and the cooling member comprises a bottom cooling member for cooling a bottom surface that is a lower surface of the bottom plate of the mold, and a side cooling member for cooling a side surface that is an outer side surface of the side plate of the mold, the side cooling member having a heat receiving surface brought into direct contact with the side surface of the mold or arranged in close proximity thereto with a predetermined gap, and being moved relative to the mold in order to change the heat exchange area, brought into contact with or arranged in close proximity to the side surface of the mold, of the heat receiving surface.

9. (Previously presented) The silicon casting apparatus according to claim 8, wherein the side cooling member is moved in a height direction of the mold relative to the mold while maintaining a state where the heat receiving surface is

kept in direct contact with the side surface of the mold.

10. (Previously presented) The silicon casting apparatus according to claim 8, wherein the side cooling member comprises a plurality of cooling members respectively having divisional heat receiving surfaces into which the heat receiving surface is divided in the height direction of the mold, each of the cooling members being relatively moved individually between a state where the divisional heat receiving surface is in direct contact with the side surface of the mold or arranged in close proximity thereto with a predetermined gap and a state where they are spaced apart from each other.

11. (Previously presented) The silicon casting apparatus according to claim 8,

wherein the bottom cooling member has a heat receiving surface brought into direct contact with a heat radiation surface that is

(1) the bottom surface of the mold, or

(2) a surface, other than a placement surface on which the mold is placed, of the pedestal comprising the placement surface with the bottom surface of the mold being in direct contact therewith

or arranged in close proximity thereto with a predetermined gap,

and is moved relative to the mold or the pedestal in order to change the heat exchange area, brought into contact with or arranged in close proximity to the heat radiation surface, of the heat receiving surface.

12. (Previously presented) The silicon casting apparatus according to claim 11, wherein the bottom cooling member comprises a plurality of cooling members respectively having divisional heat receiving surfaces into which the heat

receiving surface is divided at a center and a peripheral edge of the bottom surface of the mold, each of the cooling members being relatively moved individually between a state where the divisional heat receiving surface is in direct contact with the heat radiation surface

or arranged in close proximity thereto with a predetermined gap and a state where they are spaced apart from each other.

13. (Previously presented) The silicon casting apparatus according to claim 1, comprising

temperature detection unit for measuring a temperature of the mold, and

control unit for controlling a state of heating by the heating mechanism and a position of the cooling member relative to the mold on the basis of the temperature of the mold measured by the temperature detection unit.

14. (Previously presented) The silicon casting apparatus according to claim 1, comprising inert gas discharge unit, with a distance from the mold and the heating mechanism kept constant, for spraying inert gas on the silicon melt held inside the mold.

15. (Previously presented) A method of producing silicon ingot using the silicon casting apparatus according to claim 1, characterized by comprising the steps of: holding a silicon melt inside a mold; and subjecting the silicon melt to unidirectional solidification from a lower part to an upper part of the mold by cooling the silicon melt from below of the mold by a cooling mechanism while heating the silicon melt by a heating mechanism disposed above the mold with a predetermined distance maintained therebetween as well as moving the cooling mechanism relative to the mold as a solid-liquid interface of the silicon melt rises

due to cooling.

16. (Previously presented) The method of producing silicon ingot according to claim 15, wherein the silicon casting apparatus comprises temperature detection unit and control unit, the control unit subjecting the silicon melt to unidirectional solidification from a lower part to an upper part of the mold while controlling a state of heating by the heating mechanism and a position of the cooling member relative to the mold on the basis of a temperature of the mold measured by the temperature detection unit.

17. (Previously presented) The method of producing silicon ingot according to claim 15, wherein the silicon casting apparatus comprises inert gas discharge unit, for subjecting the silicon melt held inside the mold to unidirectional solidification from a lower part to an upper part of the mold while spraying inert gas from the inert gas discharge unit on the silicon melt.

18. (cancelled)